

## ABSTRACT OF THE DISCLOSURE

The present invention discloses a low-cost light source for optical transmission systems and optical networks based on wavelength-division multiplexing (WDM) technology. A light source in accordance with the present invention is implemented by externally injecting a narrow-band incoherent light into a Fabry-Perot laser diode (F-P LD). After injection of narrow-band incoherent light, the output of F-P LD becomes wavelength-selective rather than multi-mode and the output wavelength of F-P LD coincide with the peak wavelength of the injected incoherent light.

Multi-channel WDM light sources according to the present invention can be implemented using a single broadband incoherent light source and plurality of F-P LDs. An optical transmission system for upstream signal transmission in an passive optical network using the light source according the present invention is also disclosed.